

CURRICULUM VITAE
GRAHAM FEINGOLD

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NOAA Environmental Technology Laboratory
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Education:

1986-1989: Ph.D – Geophysics (*summa cum laude*),
Department of Geophysics and Planetary Sciences,
Tel Aviv University.

Thesis: On the evolution of raindrop spectra and their
effect on the atmosphere below cloud base:
numerical models and comparisons with observations.
Advisor: Prof. Zev Levin.

1983-1985: M.Sc – Geophysics (*summa cum laude*),
Department of Geophysics and Planetary Sciences,
Tel Aviv University.

Thesis: The size distribution of raindrops in Israel:
application to rainfall processes and radar measurements.
Advisor: Prof. Zev Levin.

1980-1982: B.Sc – Geophysics and Atmospheric Sciences,
Department of Geophysics and Atmospheric Sciences,
Tel Aviv University.

1978: B.Sc – Mechanical Engineering (1'st year),
Faculty of Engineering,
University of the Witwatersrand, Johannesburg, South Africa.

Research Experience:

- 2000–Present: Physicist, Atmospheric Lidar Division,
NOAA Environmental Technology Laboratory,
Boulder, Colorado.
- 2000–Present: Affiliate Faculty, Department of Atmospheric Science,
Colorado State University, Fort Collins.
- 1997 - 2000: Research Scientist, CIRA,
(Cooperative agreement with NOAA Environmental
Technology Laboratory)
Colorado State University, Fort Collins.
- 1994 - 1997: Research Associate, CIRA.
- 1991 - 1994: Research Associate, CIRES,
(Cooperative agreement with NOAA Environmental
Technology Laboratory)
University of Colorado, Boulder.
- 1993 - 1994: Affiliate Faculty, Department of Atmospheric Science
Colorado State University, Fort Collins.
- 1990-1991: Post-doctoral fellow at
Mesoscale and Microscale Meteorology Division, NCAR.
- 1983-1989: Research assistant, Cloud Physics Laboratory,
Department of Geophysics and Planetary Sciences,
Tel Aviv University.

Teaching Experience:

- 1986-1989: Teaching assistant,
Department of Geophysics and Planetary Sciences,
Tel Aviv University.
- Tutor: An Introduction to Atmospheric Physics
Tutor: The Physics of Clouds and Precipitation

Other Professional Activities:

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|-----------------|---|
| 2003: | Editor Atmospheric Chemistry and Physics |
| 2003: | CIRES Fellow |
| 2001 – Present: | Member: NOAA/ETL Strategic Planning Team |
| 2000: | Reviewer IPCC Report on the Indirect Effect |
| 2000: | Member: NOAA/ETL Millenium Team |
| 1993 – Present: | Member American Meteorological Society |
| 1995 – Present: | Member American Association for Aerosol Research (AAAR) |
| 1994 – Present: | Member American Geophysical Union |
| 1984 – 1990: | Member Israel Association for Aerosol Research |

Awards and Fellowships:

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| 2003: | NOAA Office of Atmospheric Research Outstanding Paper Award |
| 2002: | NOAA Office of Atmospheric Research Outstanding Paper Award |
| 1998: | NOAA Environmental Technology Laboratory Award for Innovative Research in the Modeling of Complex Cloud and Aerosol Interactions |
| 1990: | Rothschild Fellowship for Post-Doctoral Research |
| | Fulbright Fellowship for Post-Doctoral Research |
| | Canadian NSERC Fellowship for Post-Doctoral Research (declined) |
| 1986-1989: | Fellowship from the Joseph Buchmann Fund |
| 1987: | Landau Prize for Outstanding Research (Israel) |
| | Deutsche Akademischer Austauschdienst (DAAD) scholarship |
| 1982-1985: | Certificates of Merit for academic achievement,
Faculty of Exact Sciences, Tel Aviv University |
| 1978-1979: | Undergraduate Scholarship, South African Council
For Scientific and Industrial Research (CSIR) |

Invited Talks:

Kreidenweis S. M., and G. Feingold, 1995: *Modeling of Aerosol and Cloud Microphysical*

Processes. Tutorial presented at the Annual Meeting of the American Association for Aerosol Research, October 1995.

Feingold, G., 1999: *A review of cloud processing of aerosol in the marine boundary layer*. Gentner Symposium, Israel, October 1999.

Feingold, G., 2000: *Cloud-scale modeling of aerosol-cloud interactions*. Presented at the 4th Workshop on the Regional Aerosol Climate Model, Toronto, Canada, March 2000.

Feingold, G., 2001: *Aerosol-Cloud-Climate Feedbacks*. Invited presentation to National Research Council's NRC Climate Change Feedbacks Workshop. Boulder, Colorado, August 2001.

Feingold, G., 2002: *Modeling the Indirect Effect in Large Eddy Simulations*. Round Table on Boundary Layer Clouds, Toulouse, June 2002.

Feingold, G., S. M. Kreidenweis, H. Jiang, and W. R. Cotton, 2002: *Large Eddy Simulations of Aerosol-Cloud-Chemistry Interactions*. American Geophysical Union Fall Meeting, December 2002.

Feingold, G., 2003: *Observations and Modeling of Aerosol-Cloud Interactions at the Large Eddy Scale*. European Geophysical Society/American Geophysical Union Meeting, Nice, April 2003.

Publications:

Refereed Publications :

Feingold, G. and Z. Levin, 1986: The lognormal fit to raindrop spectra from frontal convective clouds in Israel. *J. Clim. Appl. Meteor.*, **25**, 1346–1363.

Feingold, G. and Z. Levin, 1987: The lognormal size distribution of raindrops: application to differential reflectivity measurements of rainfall (Z_{DR}). *J. Atmos. Ocean. Tech.*, **4**, 377–382.

Tzivion, S., G. Feingold and Z. Levin, 1987: An efficient numerical solution to the stochastic collection equation. *J. Atmos. Sci.*, **44**, 3139–3149.

Feingold, G., S. Tzivion and Z. Levin, 1988: The evolution of raindrop spectra. Part I: stochastic collection and breakup. *J. Atmos. Sci.*, **45**, 3387–3399.

Tzivion, S., G. Feingold and Z. Levin, 1989: The evolution of raindrop spectra. Part II: collisional collection/breakup and evaporation in a rainshaft. *J. Atmos. Sci.*, **46**, 3312–3327.

Feingold, G., S. Tzivion and Z. Levin, 1991: The evolution of raindrop spectra: Part III. Downdraft generation in an axisymmetrical model. *J. Atmos. Sci.*, **48**, 315–330.

- Levin, Z., G. Feingold, S. Tzivion and A. Waldvogel, 1991: The evolution of raindrop spectra: comparisons between modelled and observed spectra along a mountain slope in Switzerland. *J. Appl. Meteor.*, **30**, 893–900.
- Feingold, G., and A.J. Heymsfield, 1992: Parameterizations of condensational growth of droplets for use in general circulation models. *J. Atmos. Sci.*, **49**, 2325–2342.
- Segal, M. and G. Feingold, 1993: On the impact of summer daytime local convective cloud systems on the shelter temperature. *J. Appl. Meteor.*, **32**, 1569–1578.
- Feingold, G., 1993: A parameterization of rainfall evaporation for use in general circulation models. *J. Atmos. Sci.*, **50**, 3454–3467.
- Feingold, G., B. Stevens, W.R. Cotton, and R.L. Walko, 1994: An explicit microphysics/LES model designed to simulate the Twomey Effect. *Atmospheric Research*, **33**, 207–233.
- Feingold, G., and C. J. Grund, 1994: On the feasibility of using multi-wavelength lidar measurements to measure cloud condensation nuclei. *J. Atmos. Ocean. Tech.*, **11**, 1543–1558.
- Feingold, G., B. Stevens, W. R. Cotton, and A. S. Frisch, 1996: On the relationship between drop in-cloud residence time and drizzle production in stratocumulus clouds. *J. Atmos. Sci.*, **53**, 1108–1122.
- Stevens, B., G. Feingold, R. L. Walko and W. R. Cotton, 1996: On elements of the microphysical structure of numerically simulated non-precipitating stratocumulus. *J. Atmos. Sci.*, **53**, 980–1006.
- Stevens, B., R. L. Walko, W. R. Cotton, and G. Feingold, 1996: A note on the spurious production of cloud edge supersaturations by Eulerian models. *Mon. Wea. Rev.*, **124**, 1034–1041.
- Feingold, G., S. M. Kreidenweis, B. Stevens, and W. R. Cotton, 1996: Numerical simulation of stratocumulus processing of cloud condensation nuclei through collision-coalescence. *J. Geophys. Res.*, **101**, 21,391–21,402.
- Feingold, G., R. Boers, B. Stevens, and W. R. Cotton, 1997: A modeling study of the effect of drizzle on cloud optical depth and susceptibility. *J. Geophys. Res.*, **102**, D12, 13,527–13,534.
- Feingold, G., R. L. Walko, B. Stevens, and W. R. Cotton 1998: Simulations of marine stratocumulus using a new microphysical parameterization scheme. *Atmos. Res.*, **47–48**, 505–528.
- Stevens, B., W. R. Cotton, and G. Feingold, 1998: A critique of one and two-dimensional models of marine boundary layer clouds with detailed representations of droplet microphysics. *Atmos. Res.*, **47–48**, 529–553.
- Olsson, P. Q., J. Y. Harrington, G. Feingold, W. R. Cotton, and S. M. Kreidenweis, 1998: Exploratory cloud resolving simulations of boundary layer arctic stratus

- clouds. Part I: Warm season clouds. *Atmos. Res.*, **47–48**, 573–597.
- Feingold, G., S. Yang, R. M. Hardesty, and W. R. Cotton, 1998: Retrieving cloud condensation nucleus properties from Doppler cloud radar, microwave radiometer, and lidar. *J. Atmos. Ocean. Tech.*, **15**, 1189–1196.
- Stevens, B., W. R. Cotton, G. Feingold, and C.-H. Moeng, 1998: Large-eddy simulations of strongly precipitating, shallow, stratocumulus-topped boundary layers. *J. Atmos. Sci.*, **55**, 3616–3638.
- Frisch, A. S., G. Feingold, C. W. Fairall, T. Uttal, and J. B. Snider, 1998: On cloud radar and microwave radiometer measurements of stratus cloud liquid water profiles. *J. Geophys. Res.*, **103**, 23,195–23,197.
- Feingold, G., S. M. Kreidenweis, and Y. Zhang, 1998: Stratocumulus processing of gases and cloud condensation nuclei: Part I: trajectory ensemble model. *J. Geophys. Res.*, **103**, 19,527–19,542.
- Feingold, G., W. R. Cotton, S. M. Kreidenweis, and J. T. Davis, 1999: Impact of giant cloud condensation nuclei on drizzle formation in marine stratocumulus: Implications for cloud radiative properties. *J. Atmos. Sci.*, **56**, 4100–4117.
- Zhang, Y., S. M. Kreidenweis, and G. Feingold, 1999: Stratocumulus processing of gases and cloud condensation nuclei: Part II: chemistry sensitivity analysis. *J. Geophys. Res.*, **104**, 16,601–16,080.
- Feingold, G. A. S. Frisch, B. Stevens, and W. R. Cotton, 1999: The stratocumulus-capped boundary layer as viewed by K_{α} -band radar, microwave radiometer and lidar. *J. Geophys. Res.*, **104**, 22,195 – 22,203.
- Wulfmeyer, V., and G. Feingold, 2000: On the relationship between relative humidity and particle backscattering coefficient in the marine boundary layer determined with differential absorption lidar. *J. Geophys. Res.*, **104**, 4729–4741.
- Harrington, J. Y., G. Feingold, and W. R. Cotton, 2000: Radiative impacts on the growth of a population of drops within simulated summertime Arctic stratus. *J. Atmos. Sci.*, **57**, 766–785.
- Jiang, H., G. Feingold, W. R. Cotton, and P. G. Duynkerke, 2001: Large-Eddy Simulations of Entrainment of Cloud Condensation Nuclei into the Arctic Boundary Layer: 18 May 1998 FIRE/SHEBA Case Study. *J. Geophys. Res.*, **106**, 15,113–15,122.
- Feingold, G., and S. M. Kreidenweis, 2000: Does heterogeneous processing of aerosol increase the number of cloud droplets? *J. Geophys. Res.*, **105**, 24,351–24,361.
- Walko, R.L., W.R. Cotton, G. Feingold, B. Stevens, 2000: Efficient computation of vapor and heat diffusion between hydrometeors in a numerical model. *Atmos. Res.*, **53**, 171–183.
- Feingold, G., L. A. Remer, J. Ramaprasad, and Y. Kaufman, 2001: analysis of smoke

- impact on clouds in Brazilian biomass burning regions: An extension of Twomey's approach. *J. Geophys. Res.*, **106**, 22,907–22,922.
- Feingold, G., and P. Y. Chuang, 2002: Analysis of influence of film-forming compounds on droplet growth: Implications for cloud microphysical processes and climate. *J. Atmos. Sci.*, **59**, 2006–2018.
- Kim, C-H., S. M. Kreidenweis, G. Feingold, and G. J. Frost, 2001: Modeling cloud effects on hydrogen peroxide and methylhydroperoxide in the marine atmosphere. *J. Geophys. Res.*, **107**, 10.1029/2000JD000285.
- Frisch, A.S., M.D. Shupe, S.Y. Matrosov, I. Djalalova, G. Feingold, and M. Poellot, 2002: On the retrieval of effective radius with cloud radars. *J. Atmos. Ocean. Tech.*, **19**, 835–842.
- Feingold, G., and S. M. Kreidenweis, 2002: Cloud processing of aerosol as modeled by a large eddy simulation with coupled microphysics and aqueous chemistry. *J. Geophys. Res.*, **107**, D23, 4687, doi:10.1029/2002JD002054.
- Feingold, G., G. J. Frost, and A. R. Ravishankara, 2002: The role of NO_3 in sulfate formation in the wintertime northern latitudes. *J. Geophys. Res.*, **107**, D22, 4640, doi:10.1029/2002JD002288.
- Jiang, H., G. Feingold, and W. R. Cotton, 2002: A modeling study of entrainment of cloud condensation nuclei into the marine boundary layer during ASTEX. *J. Geophys. Res.*, **107**, D24, 4813, doi:10.1029/2001JD001502.
- Wang, S., Q. Wang, and G. Feingold, 2003: Turbulence, condensation and liquid water transport in numerically simulated nonprecipitating stratocumulus clouds. *J. Atmos. Sci.*, **60**, 262–278.
- Löhnert, U., G. Feingold, A. S. Frisch, T. Uttal, and M. D. Shupe, 2003: Analysis of two independent methods to derive liquid water profiles in spring and summer Arctic boundary layer clouds. *J. Geophys. Res.*, **108**, No. D7, 4219, doi:10.1029/2002JD002861.
- Kreidenweis, S. M., Walcek, C., C. H. Kim, G. Feingold, W. Gong, M. Z. Jacobson, X. Liu, J. Penner, A. Nenes, and J. H. Seinfeld, 2003: Modification of aerosol mass and size distribution due to aqueous-phase SO_2 oxidation in clouds: comparisons of several models. *J. Geophys. Res.*, **108**, No. D7, 4213, doi:10.1029/2002JD002697.
- Feingold, G., and B. Morley, 2003: Aerosol hygroscopic properties as measured by lidar and comparison with in-situ measurements. *J. Geophys. Res.*, **108**, No. D11, 4327, doi:10.1029/2002JD002842.
- Feingold, G., W. L. Eberhard, D. E. Veron, and M. Previdi, 2003: First measurements of the Twomey aerosol indirect effect using ground-based remote sensors. *Geophys. Res. Lett.*, **30**, No. 6, 1287, doi:10.1029/2002GL016633.
- Rosenfeld, D., and G. Feingold, 2003: Explanation of the discrepancies among satellite

observations of the aerosol indirect effects. *Geophys. Res. Lett.*, accepted.

Ervens, B., P. Herckes, G. Feingold, T. Lee, J. L. Collett, Jr. and S. M. Kreidenweis, 2003: On the drop-size dependence of organic acid and formaldehyde concentrations in fog. *J. Atmos. Chem.*, accepted.

Submitted/In Preparation :

Kim, C. H., S. M. Kreidenweis, G. Feingold, K. Anlauf, and W. R. Leaitch, 2003: Measurement and interpretation of cloud effects on the concentrations of hydrogen peroxide and organoperoxides over Ontario, Canada. *Atmos. Environ.*, submitted.

Ervens, B., G. Feingold, S. M. Kreidenweis, and G. J. Frost, 2003: Modification of internally mixed organic/inorganic aerosols by cloud chemistry. Part 1: Chemical pathways and production of organic aerosol mass. In preparation, *J. Geophys. Res.*

Selected Other Papers :

Levin, Z. and G. Feingold, 1986: The lognormal fit to raindrop size distributions in Israel with application to single and dual parameter radar measurements. Proceedings Conference on Cloud Physics and Radar Meteorology, Snowmass, AMS, JP162-165.

Reisin, T., S. Tzivion, Z. Levin and G. Feingold, 1988: Numerical simulation of an Hawaiian convective cloud with a high resolution axisymmetric model. Report 2'nd International Cloud Modelling Workshop, Toulouse, WMO/TD No. 268, 231-235.

Tzivion, S., T. Reisin, Z. Levin, G. Feingold and A. Manes, 1989: The dispersion of seeding material in clouds: a numerical experiment. Proceedings, WMO conference on Weather Modification and Applied Cloud Physics, Beijing, 171-174.

Levin, Z., S. Tzivion, E. Ganor, G. Feingold, C. Price and D. Pardess, 1989: "Effects of warm cloud processes on SO₂ trace gas chemistry: sulfate particles and desert aerosols and their effects on the chemistry of clouds and rain". Final Scientific report to the BMFT and NCRD Joint German-Israeli Research Program, 53pp.

Tzivion, S., T. Reisin, Z. Levin and G. Feingold, 1990: Numerical simulation of cloud seeding with hygroscopic nuclei. Proceedings, AMS Conf. Cloud Physics, San Francisco, July 23-27.

Cotton, W.R., R.L. Walko, G. Feingold, Z. Levin and S. Tzivion, 1992: Simulation of the Twomey Effect. Proceedings, 11'th Intnl. Conf. Cloud Physics, Montreal, August 17-21, 835-838.

Intrieri, J.M. and G. Feingold, 1993: Lidar and Radar derived cirrus microphysical properties for the 26 November 1991 Case Study. FIRE Science Team Meeting, Breckenridge, Colorado, June 1993.

Duynkerke, P. G., P. J. Jonker, P. Bechtold, A. Chlond, J. W. M. Cuijpers, J. Cuxart, G. Feingold, D. C. Lewellen, A. Lock, E. Meijgaard, C.-H. Moeng, J. Teixeira, B.

- Stevens, M. Wyant, W. R. Cotton, 1997: Simulation of a stratocumulus-topped atmospheric Boundary Layer: a comparison of models and observations. World Meteorological Organization, Programme on Physics and Chemistry of Clouds and Weather Modification Research, WMP Report 29, Clermont-Ferrand, France, 12–16 August 1996.
- Wu, T., W. R. Cotton, G. Feingold, J. Y. Harrington, and T. Reisin, 1998: Radiative Impacts on the Growth of a Population of Ice Crystals in Simulated Cirrus Clouds. AMS Cloud Physics Conference, Everett, WA, August 1998, 40–43.
- Leung, L.R., G. Feingold, and S.J. Ghan, 1999: A subgrid representation of precipitating marine boundary layer clouds. ARM Science Team Meeting, Tucson, AZ, March 1999.
- Nenes, A., J. H. Seinfeld, and G. Feingold, 2000: The effect of organic and surfactant species on cloud optical properties. American Geophysical Union Fall Meeting, San Francisco, Dec 15–19, 2000.
- Eberhard, W. L., C. J. Senff, R. D. Marchbanks, and G. Feingold, 2000: Ozone and backscatter profiles from lidar at Nashville and Atlanta. American Geophysical Union Fall Meeting, San Francisco, Dec 15–19, 2000.